Patent
Docket No: 54741US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Denker
Serial No.: 09/469,972
Filed: December 21, 1999

Group Art Unit: 1732

Examiner: M. Poe

For: METHOD OF STRETCHING FILM AND SUCH FILM

CERTIFICATE OF MAILING
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BRIEF ON APPEAL

Board of Patent Appeals and Interferences
Commissioner for Patents
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This is an appeal from the Office Action mailed on December 30, 2003 finally rejecting claims 1-11, 13-18, 20-35, 37-42, 44-48 and 71-90.

This Brief is being filed in triplicate. The fee required under 37 CFR §1.17(c) for the appeal should be charged to Deposit Account No. 503025. Appellant requests the opportunity for a personal appearance before the Board of Appeals to argue the issues of this appeal. The fee for the personal appearance will be timely paid upon receipt of the Examiner's Answer.

TABLE OF CONTENTS

REAL PARTY IN INTEREST

The real party in interest is 3M Company (formerly known as Minnesota Mining and Manufacturing Company) of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

RELATED APPEALS AND INTERFERENCES

The assignee, the assignee's legal representatives, and the patent applicant submit that there are no related appeals or interferences that are directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF CLAIMS

Claims 1-11, 13-18, 20-35, 37-42, 44-48 and 71-90 are pending in the present application. Claims 1-11, 13-18, 20-35, 37-42, 44-48 and 71-90 were rejected in a Final Office Action dated December 30, 2003. Each of the rejected claims, claims 1-11, 13-18, 20-35, 37-42, 44-48 and 71-90, has been appealed. A clean copy of the pending claims is attached as an Appendix.

STATUS OF AMENDMENTS

In response to a December 30, 2003 Final Office Action, a Notice of Appeal was filed by Appellant on March 29, 2004 and received by the United States Patent & Trademark Office on March 31, 2004. Note that May 31, 2004 is Memorial Day. No amendments have been filed after the December 30, 2003 Final Office Action.

SUMMARY OF THE INVENTION

The present invention is directed to methods of stretching a polymeric film comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips. As noted in the "Background of the Invention" section of the present application (page 1, line 32 to page 2, line 4), "driven clips" refer to clips that are actively propelled along a clip path by a motor, while "idler" clips are non-driven clips that are propelled forward only by the film itself. In other words, driven clips propel a given film forward along a film stretching apparatus, such as a tenter frame, and movement of the film causes movement of idler clips positioned between driven clips.

The methods of the present invention comprise the above-described method of stretching a polymeric film utilizing driven clips and idler clips, and further comprise at least two distinct method steps: (a) heating the polymeric film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and (b) actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

Appellant defines the term "actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film" on page 13, lines 11-21 of the specification. As used in the specification, the claims and herein, the term "actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film" refers to a film cooling step that occurs during a film stretching step and/or just after a film stretching step. At some point during the above-described method of stretching a polymeric film (i.e., a method comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips), a cooling gradient is "actively imparted" to a film portion within the stretched film.

As disclosed from page 13, line 8 to page 15, line 25, actively imparting a machine direction cooling gradient to at least a portion of the stretched film involves applying cool air onto an outer surface of the stretched film. The machine direction cooling gradient is imparted to the stretched film within any location of the stretch section and/or just after the stretch zone. See, page 13, lines 20-21. As disclosed on page 14, line 11, actively imparting

cool air onto the stretched film preferably comprises forcing cool air via air convection onto the stretched film. The cooling air must have an air temperature less than the temperature of the film. Typically, the forced cooling air has an air temperature of from about 15°C to about 135°C lower than a tenter temperature for a given tenter zone. See, page 15, lines 16-22.

In one exemplary embodiment of the present invention, the method of stretching a polymeric film comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, further comprises the steps of: a) heating the polymeric film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and b) actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips. In one preferred embodiment, the method comprises stretching a polymeric film comprising a pre-crystallized polymeric film. In a further preferred embodiment, the method comprises stretching a polymeric film comprising a vinyl polymeric film.

In a further exemplary embodiment of the present invention, the method of stretching a polymeric film comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, further comprises: a) heating the center portion and edge portions of the polymeric film to a sufficiently high temperature to allow a significant amount of stretching without breaking; b) at the onset of stretching, maintaining the edge portions of the film no hotter than the center portion of the film; and c) imparting a machine direction cooling gradient at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

As recited in each of independent claims 1, 26, 71 and 81, the methods of the present invention are directed to methods that improve the uniformity of the spacing between driven and idler clips used to hold outer edges of a film prior to, during, and after stretching. By actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount during the above-described film stretching method, the uniformity of spacing of driven clips and idler clips used in the stretching process is improved.

ISSUES ON APPEAL

The following issues are on appeal:

1) Whether claims 1-4, 6-11, 13-18, 20-24, 26, 28-30, 32-35, 37-42, 44-47, 71, 73-79, 81 and 83-89 are unpatentable under 35 U.S.C. §103(a) in view of U.S. Patent No. 3,551,546 to Gosper et al. (hereinafter, "Gosper") in combination with U.S. Patent No. 4,853,602 to Hommes et al. (hereinafter, "Hommes"); and

2) Whether claims 5, 25, 27, 31, 48, 72, 80, 82 and 90 are unpatentable under 35 U.S.C. §103(a) in view of U.S. Patent No. 3,551,546 to Gosper et al. (hereinafter, "Gosper") in combination with U.S. Patent No. 4,853,602 to Hommes et al. (hereinafter, "Hommes") and Korean Publication No. 9006301B to Kim et al. (hereinafter, "Kim").

GROUPING OF CLAIMS

For the purpose of this Appeal, rejected claims 1-11, 13-18, 20-35, 37-42, 44-48 and 71-90 do not stand or fall together. Claim 1-11, 13-18, 20-35, 37-42, 44-48 and 71-90 are separately patentable for at least the reasons given below in the "Arguments" section.

ARGUMENTS OF APPELLANT

Rejection of Claims 1-4, 6-11, 13-18, 20-24, 26, 28-30, 32-35, 37-42, 44-47, 71, 73-79, 81 and 83-89 Under 35 U.S.C. §103(a) In View Of Gosper In Combination With Hommes

Claims 1-4, 6-11, 13-18, 20-24, 26, 28-30, 32-35, 37-42, 44-47, 71, 73-79, 81 and 83-89 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,551,546 to Gosper et al. (hereinafter, "Gosper") in view of U.S. Patent No. 4,853,602 to Hommes et al. (hereinafter, "Hommes"). Reversal of this rejection is respectfully requested.

Appellant's claimed invention, as embodied in independent claim 1, is directed to a method of stretching a polymeric film comprising, *inter alia*, the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, and further comprising (a) heating the polymeric film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and (b) actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

Appellant's claimed invention, as embodied in independent claim 26, is directed to a method of stretching a polymeric film comprising, *inter alia*, the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, and further comprising: (a) heating the center portion and edge portions of the polymeric film to a sufficiently high temperature to allow a significant amount of stretching without breaking; (b) at the onset of stretching, maintaining the edge portions of the film no hotter than the center portion of the film; and (c) imparting a machine direction cooling gradient at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

Appellant's claimed invention, as embodied in independent claim 71, is directed to a method of stretching a pre-crystallized polymeric film comprising, *inter alia*, the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, and further comprising: (a) heating the polymeric film to a sufficiently high temperature to allow

a significant amount of stretching without breaking; and (b) imparting a machine direction cooling gradient to at least a portion of the width of the film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

Appellant's claimed invention, as embodied in independent claim 81, is directed to a method of stretching a vinyl polymer film comprising, *inter alia*, the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, and further comprising: (a) heating the vinyl polymer film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and (b) imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

The disclosure of Gosper relates to methods of biaxially stretching polypropylene film. As disclosed in column 2, lines 37-44 of Gosper, the disclosed method "comprises a sequence of process steps under carefully controlled conditions of temperature, stretch ratios and stretch rates whereby an oriented film product is produced which exhibits properties far superior to oriented film heretofore produced in accord with the prior art techniques previously discussed." The carefully controlled methods of Gosper comprise sequential stretching steps while carefully controlling the temperature of the film prior to, during and following each of the sequential stretching steps.

In each of the carefully controlled methods of Gosper, the method comprises the following steps in the order provided: (1) gripping outer machine-direction edges of a polypropylene film using corresponding pairs of driven clips, (2) propelling the polypropylene film along a film path via the corresponding pairs of driven clips, (3) stretching the polypropylene film in the transverse direction (i.e., the direction across the width of the polypropylene film) <u>while increasing the temperature of the film</u>, (4) releasing the outer edges of the polypropylene film prior to entry into a machine direction orienter, (5) re-gripping outer machine-direction edges of the stretched polypropylene film using corresponding machine direction orientation wheels, (6) stretching the polypropylene film in the machine direction (i.e., the direction along the length of the polypropylene film) using the machine direction orientation wheels, (7) releasing the outer edges of the polypropylene film prior to entry into an optional annealing oven, (8) optionally, re-gripping outer machine-direction edges of the biaxially stretched polypropylene film using corresponding pairs of

driven clips, step, (9) optionally, heat-setting the biaxially stretched polypropylene film, and (10) optionally, releasing the outer edges of the polypropylene film prior to take-up. See, Figs. 1-2; column 3, lines 29-36; column 4, lines 44-62; column 5, line 58 to column 6, line 31; and column 9, lines 33-37.

The disclosure of Gosper differs from Appellant's claimed invention by failing to teach or suggest at least the following claim features recited in each of independent claims 1, 26, 71 and 81: (1) a method of stretching a polymeric film comprising the step of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips; and (2) a method of stretching a polymeric film comprising the step of actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

Examiner Poe acknowledges that the disclosure of Gosper fails to teach or suggest methods as recited in each of Appellant's independent claims. Specifically, Examiner Poe states:

> Although Gosper et al. teach the basic claimed process, Gosper et al. do not specifically teach that the plurality of clips includes driven clips and idler clips with at least one idler clip between respective pairs of driven clips.

See, paper no. 9, the April 02, 2002 Office Action, page 4, lines 17-19. Examiner Poe relies on the disclosure of Hommes to allegedly cure the above-noted deficiencies in the disclosure of Gosper.

The disclosure of Hommes is directed to a stretching apparatus suitable for use in a biaxial film stretching process. An exemplary stretching apparatus is shown in Fig. 14. The disclosed stretching apparatus stretches a given film using elongated primary lines extending along machine-direction edges of a film to be stretched, and pairs of corresponding secondaries that are propelled along the elongated primary lines. Each pair of corresponding secondaries grips the outer edges of the film and propels the film through the stretching apparatus. Further, and most important to the invention of Hommes, each pair of corresponding secondaries is connected to a linear synchronous motor control system that uses electromagnetic wave technology to precisely propel and control the position of each

secondary relative to adjacent secondaries and the corresponding secondary within a given pair of secondaries. See, column 20, line 32 to column 21, line 29.

When comparing the invention of Hommes to prior publications, Hommes discloses from column 20, line 64 to column 21, line 29:

> These prior publications, however, do not teach the process nor the carefully coordinated controls required in drawing film in accordance with the instant invention. In the invention, pairs of clips which are directly opposite each other, are propelled, while maintaining this opposite positioning, at identical velocities and precise spacings with adjacent, opposed, center clip pairs. This is made possible by use of the synchronous linear motor system of this invention.

The disclosure of Hommes teaches the use of a synchronous linear motor system to propel each pair of corresponding secondaries (including a film-gripping clip attached to each secondary) along a given primary line in response to electromagnetic force applied to each secondary. Each secondary is a "driven" clip. The disclosure of Hommes further discloses that idler clips may be used in combination with the driven secondaries to minimize film edge scalloping between adjacent driven secondaries. See, column 23, lines 12-32.

It is important to note that during the film stretching process disclosed in Hommes, the film edges are always gripped prior to, during and after the stretching step(s). In fact, an important feature of the synchronous linear motor system disclosed in Hommes is the ability of one zone of the stretching apparatus to correspond with an adjacent zone of the stretching apparatus in order to maintain synchronized film control. Unlike the method of Gosper disclosed above, at no time are the film edges released and allowed to orient themselves during the disclosed process of Hommes.

The disclosure of Hommes differs from Appellant's claimed invention by failing to teach or suggest at least the following claim features recited in each of independent claims 1, 26, 71 and 81: a method of stretching a polymeric film comprising the step of actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips. It is important to note that the disclosure of Hommes fails to teach or suggest any method steps for improving the uniformity of spacing of the driven and idler clips in the disclosed apparatus other than the use of the above-described synchronous linear motor

system. The disclosure of Hommes does not teach or suggest the possibility of using cool air to control the position of driven and idler clips relative to one another.

Examiner Poe suggests that one of ordinary skill in the art, given the teaching of Gosper, would have (1) realized that the disclosed carefully controlled sequential film stretching method of Gosper had one or more shortcomings, (2) sought out the teaching of Hommes directed to a simultaneous film stretching method utilizing a synchronous linear motor system, (3) picked the driven and idler clip system from the method of Hommes, and (4) incorporated the driven and idler clip system from the teaching of Hommes into the sequential film stretching method of Gosper. Examiner Poe specifically states on page 4, lines 25-28 of the April 02, 2002 Office Action (paper no. 9):

> It would have been obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to provide idler clips between the driven clips in the process of Gosper et al. as taught by Hommes et al. to minimize film edge scalloping.

Appellant disagrees.

As discussed above and in Appellant's August 30, 2002 Amendment and Response (paper no. 12), the teachings of Gosper and Hommes disclose two separate and distinct methods of biaxially stretching polymer films. Each of the methods disclosed in the teachings of Gosper and Hommes require specific, carefully controlled process parameters, process steps and process equipment in order to meet the objectives of the given teaching. Examiner Poe suggests that one skilled in the art, given the teachings of Gosper and Hommes, would have removed select portions of the teaching of Hommes, and incorporated the select portions into the process disclosed in Gosper, modifying the disclosed process of Gosper. Appellant disagrees.

Given the differences between the processes disclosed in the teachings of Gosper and Hommes, it is not clear to Appellant why one of ordinary skill in the art, given the teaching of Gosper and the "carefully controlled" parameters and equipment needs of the disclosed sequential stretching process, would have modified the disclosed process of Gosper as suggested by Examiner Poe. Clearly, Gosper does not teach or suggest the use of idler clips. Further, Gosper does not teach or suggest the need to add idler clips to the disclosed stretching apparatus of Gosper.

Examiner Poe suggested that one skilled in the art would have been motivated to modify the disclosed process and apparatus in the teaching of Gosper in order to reduce

film scalloping during the disclosed process. Appellant respectfully submits that the teaching of Gosper adequately addresses any problem associated with "film scalloping" and control over the edges of a stretched polypropylene film by disclosing the use of a combination of gripping clips and machine direction orientation wheels. See, Figs. 1-2, driven clips 21, 22, and wheels 25. There is no suggestion in the teaching of Gosper that the combination of gripping clips and machine direction orientation wheels is inadequate or inferior to the driven and idler clip system as disclosed in Hommes. More importantly, there is no suggestion in the teaching of Gosper for the need to replace the combination of gripping clips and machine direction orientation wheels with an alternative system, such as the driven and idler clip system as disclosed in Hommes.

Further, it is not clear to Appellant why one of ordinary skill in the art, given the teaching of Gosper, would even seek out the teaching of Hommes given (1) the above-described differences between the disclosed methods of stretching a polymer film, and (2) the required process steps, parameters, and equipment necessary for performing each of the disclosed methods in the teaching of Gosper and Hommes. As discussed above and disclosed throughout the teaching of Gosper, the methods of Gosper require a specific sequence of precise method steps including a transverse stretching method step (using driven gripping clips) followed by a machine direction stretching method step (using machine direction orientation wheels). In contrast, the teaching of Hommes is directed to a stretching method requiring one or more stretching steps wherein a given film is stretched in the transverse and machine directions (using driven and idler clips) such that the film edges are gripped at all times during the stretching step(s). In addition, the methods of Gosper require specific temperature profiles throughout the disclosed process, while the method of Hommes does not require such specific temperature profiles.

It is not clear to Appellant why one of ordinary skill in the art would have modified the teaching of Gosper as proposed by Examiner Poe. Further, it is not clear to Appellant why one of ordinary skill in the art would pick and choose select portions of the teaching of Hommes and incorporate these select portions into the teaching of Gosper as proposed by Examiner Poe. Appellant respectfully submits that the only motivation for such a proposed modification of the teaching of Gosper has been gleaned from a review of Appellant's invention, not from what is being taught or suggested in the art. Further, Appellant respectfully submits that Examiner Poe has resorted to the improper use of "pick and choose" reasoning in an attempt to recreate Appellant's claimed invention. For at least

these reasons, it is respectfully submitted that the proposed combination of select portions of the teachings of Gosper and Hommes is improper.

In addition, Appellant respectfully submits that even if it were proper to combine select portions of the teaching of Gosper and select portions of the teaching of Hommes as proposed by Examiner Poe, the resulting method would fail to teach or suggest Appellant's claimed invention as embodied in independent claims 1, 26, 71 and 81. If the driven and idler clip system as disclosed in Hommes was incorporated into the process of Gosper to replace the disclosed combination of gripping clips and machine direction orientation wheels, the combined teaching would still not teach or suggest a method of stretching a polymeric film comprising the step of **actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film <u>in an effective amount to improve the uniformity of spacing of the driven and idler clips</u>**. Neither of the teachings of Gosper or Hommes recognizes that an active cooling step applied during stretching and/or just after stretching may be used to improve the uniformity of spacing of the driven and idler clips. There is no suggestion in the proposed combined teaching of Gosper in view of Hommes that a cooling step following a film heat-setting step, such as disclosed in the teaching of Gosper, has any effect on the uniformity of spacing of the driven and idler clips. Further, there is no suggestion in the proposed combined teaching regarding the positive effects of applying a cooling step during a stretching step and/or just after a stretching step in a biaxial stretching apparatus, namely an improvement in the uniformity of spacing of the driven and idler clips.

For at least the reasons given above, Appellant respectfully submits that a *prima facie* case of obviousness has not been made, and that the combination of the teaching of Gosper with the teaching of Hommes is improper. Appellant further respectfully submits that the proposed combined teaching of Gosper in view of Hommes fails to make obvious Appellant's claimed invention as embodied in independent claims 1, 26, 71 and 81. Since claims 2-4, 6-11, 13-18, 20-24, 28-30, 32-35, 37-42, 44-47, 73-79 and 83-89 depend from independent claims 1, 26, 71 and 81, and recite additional claim features, Appellant respectfully submits that the proposed combined teaching of Gosper in view of Hommes fails to make obvious claims 2-4, 6-11, 13-18, 20-24, 28-30, 32-35, 37-42, 44-47, 73-79 and 83-89.

For at least the reasons given above, it is respectfully submitted that the rejection of claims 1-4, 6-11, 13-18, 20-24, 26, 28-30, 32-35, 37-42, 44-47, 71, 73-79, 81 and

83-89 under 35 U.S.C. §103(a) as being unpatentable over Gosper in view of Hommes should be reversed.

Rejection of Claims 5, 25, 27, 31, 48, 72, 80, 82 and 90 Under 35 U.S.C. §103(a) In View Of Gosper In Combination With Hommes and Kim

Claims 5, 25, 27, 31, 48, 72, 80, 82 and 90 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gosper in view of Hommes et al., and further in view of Korean Publication No. 9006301B to Kim et al. (hereinafter, "Kim"). Reversal of this rejection is respectfully requested.

Claims 5, 25, 27, 31, 48, 72, 80, 82 and 90 depend from independent claims 1, 26, 71 and 81 described above, and recite further claim features. In particular, claims 5, 25, 27, 31, 48, 72, 80, 82 and 90 recite that the step of actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film involves either (1) cooling at least a portion of the film by at least 3°C (claims 5 and 31); (2) forcing cooling air onto the film, wherein the cooling air is at least 5°C cooler than the film (claims 25, 48, 80 and 90); or (3) actively cooling the opposed edge portions of the film (claims 27, 72 and 82).

Examiner Poe acknowledges that the proposed combined teaching of Gosper and Hommes fails to teach or suggest methods as recited in each of claims 5, 25, 27, 31, 48, 72, 80, 82 and 90. Specifically, Examiner Poe states in the April 02, 2002 Office Action (paper no. 9), page 7, lines 13-17:

> Although Gosper et al. teach maintaining the edges of the film at least below that of the intermediate web portion, Gosper et al. do not teach actively cooling the opposed edge portions, cooling at least a portion of the film by at least 3C and forcing cooling air onto the film wherein the cooling air is at least 5C cooler than the film. However, these limitations would have been obvious in the process of Gosper et al. in view of Kim et al. as discussed further below.

Examine Poe relies on the teaching of Kim in combination with the above-described teaching of Gosper and Hommes to reject claims 5, 25, 27, 31, 48, 72, 80, 82 and 90.

The disclosure of Kim is directed to a film drawing process utilizing a high temperature air nozzle having a temperature differential across a width of the air nozzle. The Abstract of Kim specifically states that "the [film] sheet is stretched by passing it through a high temperature air nozzle." A central portion of the film sheet is heated to 125-140°C while edge portions of the film sheet are heated to 120-135°C.

Like the teachings of Gosper and Hommes described above, the teaching of Kim also fails to teach or suggest a method of stretching a polymeric film comprising the step of actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips. In addition, like the teaching of Gosper, the teaching of Kim fails to teach or suggest a method of stretching a polymeric film comprising the step of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips.

Examiner Poe suggests that one of ordinary skill in the art, given the teaching of Gosper, would have (1) realized that the disclosed carefully controlled sequential film stretching method of Gosper had one or more shortcomings, (2) sought out the teaching of Hommes directed to a film stretching method utilizing a synchronous linear motor system, (3) picked the driven and idler clip system from the method of Hommes, (4) incorporated the driven and idler clip system from the teaching of Hommes into the sequential film stretching method of Gosper, (5) then, sought out the teaching of Kim, and (6) incorporated a high temperature air nozzle somewhere in the process of Gosper in order for the film to pass through the nozzle, applying a differential temperature profile across the width of the film. Appellant disagrees.

For reasons similar to those expressed above with regard to the proposed combination of the teachings of Gosper and Hommes, Appellant respectfully submits that one of ordinary skill in the art would not have picked select portions of the teachings of Gosper, Hommes, and Kim, and then recombined the select portions as proposed by Examiner Poe in an attempt to recreate Appellant's claimed invention as embodied in claims 5, 25, 27, 31, 48, 72, 80, 82 and 90. The only motivation for such a proposed modification of the teaching of Gosper has been gleaned from a review of Appellant's invention, not from what is being taught or suggested in the art. For at least these reasons, it is respectfully submitted that the proposed combination of select portions of the teachings of Gosper, Hommes and Kim is improper.

Further, for reasons similar to those expressed above with regard to the proposed combination of the teachings of Gosper and Hommes, Appellant respectfully submits that even if it were proper to combine select portions of the teachings of Gosper, Hommes and Kim as suggested by Examiner Poe, the resulting method and apparatus of the

combined teaching would fail to teach or suggest the method of the present invention. The proposed combined teaching would fail to teach or suggest a method comprising an active cooling step, wherein the active cooling step, when applied during and/or after a stretching step in a biaxial stretching apparatus, results in an improvement in the uniformity of spacing of the driven and idler clips.

For at least the reasons given above, it is respectfully submitted that the rejection of claims 5, 25, 27, 31, 48, 72, 80, 82 and 90 under 35 U.S.C. §103(a) as being unpatentable over Gosper in view of Hommes and further in view of Kim should be reversed.

CONCLUSION

For at least the reasons given above, Appellant respectfully submits that none of the references or combinations of references relied upon by Examiner Poe make obvious the claimed invention as embodied in Appellant's claims 1-11, 13-18, 20-35, 37-42, 44-48 and 71-90. Accordingly, the above rejections should be reversed.

Please charge any additional fees or credit any overpayment to Withers & Keys, LLC, Deposit Account No. 503025.

Respectfully submitted,

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Atty. Docket No. 10002.0060US01

APPENDIX

1. In a method of stretching a polymeric film comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, the improvement comprising:

a) heating the polymeric film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and

b) actively imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

2. The method of claim 1, wherein step b) includes cooling the opposed edge portions of the film.

3. The method of claim 1, wherein step b) includes cooling the center portion of the film.

4. The method of claim 1, wherein step b) includes cooling substantially the entire width of the film.

5. The method of claim 1, wherein step b) includes cooling at least a portion of the film by at least 3°C.

6. The method of claim 1, wherein the method further includes propelling the clips through a stretch section in which the film is stretched and subsequently through a post-stretch treatment section, and wherein step b) is performed in at least one of the stretch section and the treatment section.

7. The method of claim 1, wherein the method includes biaxially stretching the film.

8. The method of claim 7, wherein the method includes simultaneously biaxially stretching the film by propelling the clips at varying speeds in the machine direction along clip guide means that diverge in the transverse direction.

9. The method of claim 8, wherein the method includes stretching the film to a final stretch ratio of at least 2:1 in the machine direction and at least 2:1 in the transverse direction.

10. The method of claim 1, wherein there are at least two idler clips between each respective pair of driven clips.

11. The method of claim 1, wherein the film comprises a thermoplastic film.

13. The method of claim 11, wherein the film comprises a semi-crystalline film.

14. The method of claim 13, wherein the semi-crystalline film has a degree of crystallinity greater than about 1% prior to said heating.

15. The method of claim 13, wherein the semi-crystalline film has a degree of crystallinity greater than about 7% prior to said heating.

16. The method of claim 13, wherein the semi-crystalline film has a degree of crystallinity greater than about 30% prior to said heating.

17. The method of claim 11, wherein the film comprises a vinyl polymer.

18. The method of claim 17, wherein the film comprises a polyolefin.

20. (Previously amended) The method of claim 18, wherein the film comprises polypropylene.

21. The method of claim 20, wherein the method includes stretching the film to a final area stretch ratio of at least 16:1.

22. The method of claim 21, wherein the method includes stretching the film to a final area stretch ratio of from 25:1 to 100:1.

23. The method of claim 20, wherein step a) comprises heating the film to from 120 to 165°C.

24. The method of claim 23, wherein step a) comprises heating the film to from 150 to 165°C.

25. The method of claim 23, wherein step b) includes forcing cooling air onto the film, wherein the cooling air is at least 5°C cooler than the film.

26. In a method of stretching a polymeric film comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, the improvement comprising:

a) heating the center portion and edge portions of the polymeric film to a sufficiently high temperature to allow a significant amount of stretching without breaking;

b) at the onset of stretching, maintaining the edge portions of the film no hotter than the center portion of the film; and

c) imparting a machine direction cooling gradient at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

27. The method of claim 26, wherein step b) includes actively cooling the opposed edge portions of the film.

28. The method of claim 26, wherein step c) includes cooling the center portion of the film.

29. The method of claim 26, wherein step c) includes cooling the opposed edge portions of the film.

30. The method of claim 26, wherein step c) includes cooling substantially the entire width of the film.

31. The method of claim 26, wherein step c) includes cooling at least a portion of the film by at least 3°C.

32. The method of claim 26, wherein the method further includes propelling the clips through a stretch section in which the film is stretched and subsequently through a post-stretch treatment section, and wherein step c) is performed in at least one of the stretch section and the treatment section.

33. The method of claim 26, wherein the method includes biaxially stretching the film.

34. The method of claim 33, wherein the method includes simultaneously biaxially stretching the film by propelling the clips at varying speeds in the machine direction along clip guide means that diverge in the transverse direction.

35. The method of claim 26, wherein the film comprises a thermoplastic film.

37. The method of claim 35, wherein the film comprises a semi-crystalline film.

38. The method of claim 37, wherein the semi-crystalline film has a degree of crystallinity greater than about 1% prior to said heating.

39. The method of claim 38, wherein the semi-crystalline film has a degree of crystallinity greater than about 7% prior to said heating.

40. The method of claim 37, wherein the semi-crystalline film has a degree of crystallinity greater than about 30% prior to said heating.

41. The method of claim 35, wherein the film comprises a vinyl polymer.

42. The method of claim 41, wherein the film comprises a polyolefin.

44. The method of claim 42, wherein the film comprises polypropylene.

45. The method of claim 44, wherein the method includes stretching the film to a final area stretch ratio of from 16:1 to 100:1.

46. The method of claim 44, wherein step a) comprises heating the film to from 120 to 165°C.

47. The method of claim 44, wherein step a) comprises heating the film to from 150 to 165°C.

48. The method of claim 46, wherein step c) includes forcing cooling air onto the film, wherein the cooling air is at least 5°C cooler than the film.

71. In a method of stretching a pre-crystallized polymeric film comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, the improvement comprising:

a) heating the polymeric film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and

b) imparting a machine direction cooling gradient to at least a portion of the width of the film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

72. The method of claim 71, wherein step b) includes actively cooling the opposed edge portions of the film.

73. The method of claim 71, wherein step b) includes actively cooling the center portion of the film.

74. The method of claim 71, wherein step b) includes actively cooling substantially the entire width of the film.

75. The method of claim 71, wherein the method further includes propelling the clips through a stretch section in which the film is stretched and subsequently through a post-stretch treatment section, and wherein step b) is performed in at least one of the stretch section and the treatment section.

76. The method of claim 71, wherein the method includes simultaneously biaxially stretching the film by propelling the clips at varying speeds in the machine direction along clip guide means that diverge in the transverse direction.

77. The method of claim 71, wherein the film comprises polypropylene.

78. The method of claim 77, wherein the method includes stretching the film to a final area stretch ratio of from 16:1 to 100:1.

79. The method of claim 77, wherein step a) comprises heating the film to from 120 to 165°C.

80. The method of claim 79, wherein step b) includes forcing cooling air onto the film, wherein the cooling air is at least 5°C cooler than the film.

81. In a method of stretching a vinyl polymer film comprising the steps of grasping the film with a plurality of clips along the opposing edges of the film and propelling the clips to thereby stretch the film, wherein the plurality of clips includes driven clips and idler clips, with at least one idler clip between respective pairs of driven clips, the improvement comprising:

a) heating the vinyl polymer film to a sufficiently high temperature to allow a significant amount of stretching without breaking; and

b) imparting a machine direction cooling gradient to at least a portion of the width of the stretched film in an effective amount to improve the uniformity of spacing of the driven and idler clips.

82. The method of claim 81, wherein step b) includes actively cooling the opposed edge portions of the film.

83. The method of claim 81, wherein step b) includes actively cooling the center portion of the film.

84. The method of claim 81, wherein step b) includes actively cooling substantially the entire width of the film.

85. The method of claim 81, wherein the method further includes propelling the clips through a stretch section in which the film is stretched and subsequently through a post-stretch treatment section, and wherein step b) is performed in at least one of the stretch section and the treatment section.

86. The method of claim 81, wherein the method includes simultaneously biaxially stretching the film by propelling the clips at varying speeds in the machine direction along clip guide means that diverge in the transverse direction.

87. The method of claim 81, wherein the film comprises polypropylene.

88. The method of claim 89, wherein the method includes stretching the film to a final area stretch ratio of from 16:1 to 100:1.

89. The method of claim 87, wherein step a) comprises heating the film to from 120 to 165°C.

90. The method of claim 89, wherein step b) includes forcing cooling air onto the film, wherein the cooling air is at least 5°C cooler than the film.